

Serial No. 09/124,642

P6189

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Brief of
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Jie NI et al.

Serial No.: 09/124,642

Group Art Unit: 2634

Filed: July 29, 1998

Examiner: M. GHAYOUR

For: METHOD AND APPARATUS FOR SYNCHORNIZING A
NETWORK LINK

Assistant Commissioner for Patents
Washington, D.C. 20231

SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. This Brief is being filed with \$320 to cover the appeal brief submission fee as well as a Petition and Fee for a three-month extension of time.

Respectfully submitted,

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BOARD OF PATENT APPEALS
AND INTERFERENCES

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT
APPEALS AND INTERFERENCES

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APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192(c)

Sir:

The following comprises Appellant's Brief on Appeal against the final rejection dated May 8, 2002, rejecting claims 1-19. This Appeal Brief is filed in triplicate and is accompanied by the required appeal fee set forth in 37 C.F.R. § 1.17(f). Appellant's Notice of Appeal was filed on October 15, 2002.

REAL PARTY IN INTEREST

The real party in interest in this appeal is Intel Corporation, assignee of the entire interest in the above identified patent application.

RELATED APPEALS AND INTERFERENCES

The Appellant, their legal representative, and the assignee are presently unaware of any appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

This is an appeal from the final Office Action dated May 8, 2002, wherein claims 1-19 were finally rejected under 35 U.S.C. § 103(a).

A Response was filed under 37 C.F.R. § 1.116 on July 8, 2002 responding to the final Office Action, but not amending any claims. Thus, the claims stand as amended in Applicant's response to the Office Action of July 31, 2001. Claims 1-19 are appealed and are set forth in their entirety in Appendix A.

STATUS OF THE AMENDMENTS

All amendments have been entered.

SUMMARY OF THE INVENTION

Briefly, embodiments of the present invention relate to a method and apparatus for synchronizing two ends of a bi-directional network communication path. A sequence of predetermined characters are repeatedly transmitted from an end of a bi-directional network communication path if reception is lost at that end. Synchronization or resynchronization occurs from both ends if the sequence of predetermined characters is received at the other end.

As shown in the state diagram of Figure 1, when a node is initially powered or initialized in state 110, there is no synchronization. Thus, state 110 is deemed a Loss of Sync (LOS) state. The node remains in this LOS state 110 until it receives a specific character, namely, an "Idle 1" character. When an Idle 1 character is detected, the node

moves to state 120 "Idle 1 Detect 1" where it remains until a second Idle 1 character is detected and which time the node moves to State 130 "Idle 1 Detect 2". Again, the node remains in State 130 until a third Idle 1 character is received, at which time the node moves to State 140 "Idle 1 Detect 3". As discussed on page 5, lines 10-30 of the application, in state 130 a synchronized link has still not been established as the link is only partially synchronized. After receiving three "Idle 1" characters, the node then waits to receive an "Idle 2" character. If an "Idle 2" character is not received within a predetermined amount of time, the node reverts to the LOS state waiting again for three "Idle 1" characters. If, however, an "Idle 2" character is received, the node moves to State 160 indicating that a good link has been established.

As discussed on page 6, lines 1-15, once in state 160, the link is synchronized and flow control characters can be successfully transmitted and received across the link. The node remains in state 160 until one of two conditions occur. That is, either non-valid data is received, suggesting that synchronization on this node has been compromised or, until an "Idle 1" character has been received indicating that the remote link has lost synchronization and is trying to reestablish sync. In the first case, if non-valid data is received, the node starts transmitting "Idle 1" characters to inform the remote link that sync has been lost. In the second case, the node receives "Idle 1" characters from the remote link. As discussed on page 6, lines 12-15, if an "Idle 1" character is received while in state 160, the node moves to state 170 whereat the link is still considered good. However, if seven "Idle 1" characters are received (indicating the remote link has initiated a diagnostic process to test a probable loss of sync condition at that end) the node enters an LOS state. Thus, using Idle 1 characters in this manner as a diagnostic tool, the node at either end of the link may be readily aware of the synchronization condition at the other end of the link and corrective action may be taken.

ISSUES

1. Whether claims 1-19 are obvious under 35 U.S.C. § 103(a) in view of U.S. Patent 6,011,821 to Sauer et al. (Sauer) in view of U.S. Patent 6,081,567 to Olafsson?
2. Whether claims 2, 3, 11, 12, and 15 are obvious under § 103(a) in view of Sauer and Olafsson further in view of Jordan et al, (Jordan) (IBM Technical Disclosure Bulletin,

May 1965)?

GROUPING OF THE CLAIMS

The rejected claims do not stand or fall together. The claims are grouped as follows:

Group I. Claims 1, 2, 4, 10, 11, and 16-19;

Group II. Claims 5, 9, 12, and 14;

Group III. Claims 3 and 15;

Group IV. Claims 6, 7, and 13;

Group V. Claim 8

Appellant submits that claims in Group II are patentable not only by virtue of their dependency from claims on Group I, but also separately patentable by virtue of using three consecutive Idle 1 characters for synchronization.

Appellant submits that claims in Group III are patentable not only by virtue of their dependency from claims in Group I, but also separately patentable with respect to using seven consecutive Idle 1 characters for synchronization.

Appellant submits that claims in Group IV are patentable not only by virtue of their dependency from claims in Group I, but also separately patentable with respect to using an Idle 2 character in the synchronization process.

Appellant submits that the claim in Group V is patentable not only by virtue of its dependency from claims in Group I, but also separately patentable with respect to using a hysteresis sub-process if non-valid data is detected.

The reasons why Appellant considers the rejected claims to be separately patentable are more explicitly set out below.

ARGUMENT

As a matter of law, the prior art rejections are in error and are made through the Examiner's impermissible use of hindsight gained by knowledge of Appellant's invention. Indeed, as discussed below, the rejections are made through a misapplication of the law. Further, as a matter of fact, the Examiner's analysis of the references with regard to the claimed invention is fatally flawed and erroneous for the reasons given below.

A. The Prior Art**1. U.S. Patent 6,011,821 to Sauer:**

Sauer is directed to a process for synchronization of matching circuits of a communication system having several modules. However, the method taught by which synchronization is achieved appears very different than that recited in the appealed claims. In particular, column 2, lines 61 *et seq.*, disclose Sauer's method of synchronization to include synchronizing other modules to a master module whereby module 1 generates a frame pulse which is transmitted to the synchronization module by means of a command channel of the transmitter 9. Thereafter a phase lock loop (PLL) circuit in the matching circuit 8 is synchronized to the frame pulse signal.

While Sauer may appear to teach a method for synchronization, it is unrelated to the appealed claims. Indeed, the appealed claims at hand have nothing in common with Sauer's teaching of a PLL in a matching circuit syncing on a frame pulse.

2. U.S. Patent 6,081,567 to Olafsson:

Olafsson is directed to a method and apparatus for synchronizing a data communication system "to a periodic digital impairment". In particular, the Examiner relies on Column 11, lines 8-50, wherein Olafsson appears to set forth their synchronization scheme. The sync method is also shown in Olafsson's Figure 7. As shown and described, to achieve resync between two modems communicating over a telephone line the first modem transmits a "known signal segment" 704. The second modem receives the "known signal segment" and identifies the first symbol in the

segment 706. Upon identifying the first symbol in the segment, a counter is reset to zero (column 11, line 57). At this point, the counters in the respective modems are “resynchronized” (column 11, line 59).

Again, even if one were to analogize the “known signal segment” taught by Olafsson with Appellant’s “Idle 1” character as the Examiner has done, the remainder of Olafsson’s process is unrelated to the appealed claims.

3. Jordan et al., IBM TBD:

Jordan appears to be directed to a synchronous transmitter-receiver clocking method. The Examiner relies on Jordan for teaching the use of “Idle” characters in a synchronization process (see Jordan, page 3, paragraph 3). Here, Jordan discloses that transmitting a string of idle characters for one and one-half seconds from terminal B to terminal A is sufficient to permit complete resynchronization.

Again, while Jordan appears to disclose Idle characters used for resync purposes, it does not teach or remotely suggest the use of Idle characters set forth in the appealed claims.

4. U.S. Patent 5,259,004 to Nakayama:

Nakayama appears to be directed to a frame synchronization dependent type bit synchronization extraction circuit. The Examiner relies on this reference only to show “signaling the loss of synchronization”. In particular, the Examiner relies on column 5, lines 55 et seq. wherein Nakayama discusses outputting a “0” as the frame synchronization signal to show or indicate loss of synchronization. However, this reference has been cited by the Examiner only against claim 4. Claim 4 has been included in Group I to stand or fall with its parent claim 1. Thus, Nakayama need not be further discussed.

B. The Claimed Invention:

All claims in all groups recite the feature:

“repeatedly transmitting from one end of the bi-directional communication path a sequence of predetermined characters if reception is lost at that end”

The above quote is from claim 1, however, all of the independent claims 1, 10, and 16, include this feature in the same or similar wording.

For example, independent claim 10 recites *“said network interface unit being further adapted to detect a predetermined set of characters signaling to resynchronize the link from that end if reception is lost at the other end”*.

Independent claim 16 recites *“said nodes being adapted to bi-directionally resynchronize the link so that if reception is lost at one end”*.

C. The Examiner's Application on the Prior Art to the Independent Claims in Group I

The Examiner has relied on the combination of Sauer and Olafsson in rejecting the independent claims included in Group I. The Examiner summarizes his argument on page 4, numbered paragraph 3, of the final Office Action. Therein the Examiner states:

“As to claims 1, 10, and 16, Sauer et al. discloses the conditions under which synchronization or resynchronization is required in a communication system such as the loss of reception (see col. 3, lines 12-13). On the other hand, Olafsson discloses, in the same field of endeavor, that upon the determination that the synchronization is lost between two ends (two modems) a repetition of a known set of symbols (i.e., predetermined characters) is transmitted from one end (i.e., one of the modems) to the other end until synchronization is regained (i.e., the two ends are resynchronized)” (emphasis added).

However, it is respectfully submitted that, at best, both references discuss resynchronization when synchronization is lost, as opposed the present invention which is directed to resynchronization when reception is lost. Neither reference distinguishes between loss of reception and loss of synchronization. The Examiner's statements and the application of the prior art references appear to treat these two as if they were the same,

and they are not. Indeed, a node may still be receiving a signal even though synchronization has been lost. Neither Sauer nor Olafsson teach or suggest a communication system takes measures when reception is lost.

As a matter of law, these rejections are in error and, as discussed below, the Examiner has made the rejection only through the use of impermissible hindsight reconstruction gained by knowledge of Appellant's invention.

Further, as a matter of fact, the Examiner's analysis of the references with regard to the claimed invention is flawed and erroneous as also discussed below.

D. The Examiner's Rejection is in Error

Referring to MPEP § 2143, titled "Basic Requirements for a *Prima Facie* case of Obviousness", the MPEP mandates that:

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claimed limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not applicant's disclosure." (emphasis added).

It is again respectfully submitted that all of the features, recited in the claims, are not present even if Sauer and Olafsson are combined. Thus, the combination does not show *prima facie* obviousness under § 103. Specifically, the combination does not show at least:

" *repeatedly transmitting from one end of the bi-directional communication path a sequence of predetermined characters if reception is lost at that end*" (emphasis added).

It is incumbent upon the Examiner to establish a factual basis to support the legal

conclusion of obviousness. In re Fine, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988). This objective can only be established by an objective teaching in the prior art or by cogent reasoning that the knowledge is available to one of ordinary skill in the art. In re Lalu, 747 F.2d 703, 223 U.S.P.Q. 1257 (Fed. Cir. 1988). Here there is none.

Indeed, in the case at hand, the Examiner has failed to disregard what he has been taught by the present invention and has failed to cast his mind back to the time that the invention was made to determine what would have been obvious to one ordinarily skilled in the art who had available only the references and the then-accepted wisdom in the art.

Assuming *arguendo* that Sauer could be interpreted in the manner suggested by the Examiner, the rejection would still be insufficient since as a matter of fact both Sauer and Olafsson fail to distinguish between loss of reception and loss of synchronization.

The PTO has the initial burden under section 103 to establish a *prima facie* case of obviousness. See, In re Piasecki, 223 USPQ 785, 788; In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). The PTO can satisfy this burden *only* by showing some *objective* teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Lalu, *supra*; see also, Ashland Oil, Inc. V. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985); ACS Hosp. Sys., Inc. v. Monteviore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Here, it is respectfully submitted that the Examiner has failed to show *prima facie* obviousness.

As such, it is respectfully requested that the Board reverse the Examiner on this ground of rejection.

E. Separate Patentability of Dependent Claims:

Even if the Board affirms the Examiner's rejection for the claims of Group I, it is respectfully submitted that the Dependent claims included in Groups II-V are patentable in their own right and not obvious over the prior art of record.

1. The Separate Patentability of Group II:

Additionally, there is no teaching of the subject matter recited the dependent

claims in Group II comprising claims 5, 9, 12, and 14, which are separately patentable by virtue of using three consecutive Idle 1 characters. For example, claim 5 recites “*wherein resynchronization at an end comprises detecting and transmitting three successive idle 1 characters*” (emphasis added). Claims 9, 12, and 14 recite similar language.

The Examiner rejects these claims with little comment. On page 6 of the final Office Action, the Examiner appears to use the reference to Jordan to teach the use of an “Idle Character” for resynchronization. However, the rejected claims clearly recite the use of “three successive idle 1 characters”. The mere fact that Jordan may teach Idle 1 characters in general, does not make obvious the use of three successive idle 1 characters as claimed. This is simply not taught or suggested by the prior art of record.

As such, it is respectfully requested that the Board reverse the Examiner with respect to the rejection of these claims.

2. Separate Patentability of Claims in Group III:

Similar to the claims in Group II, the claims in Group III are directed to the use of seven successive Idle 1 characters. For Example, claim 3 recites “wherein the sequence of predetermined characters comprises seven successive idle 1 characters” (emphasis added). Claim 15 recites similar language.

Again, the Examiner rejects these claims with little comment. On page 6 of the final Office Action, the Examiner again appears to use the reference to Jordan to teach the use of an “Idle Character” for resynchronization. However, the rejected claims clearly recite the use of “seven successive idle 1 characters”. The merits of using seven such characters is disclosed on page 6, lines 10-15 of the application. Again, the mere fact that Jordan may teach Idle 1 characters in general, does not make obvious the use of seven successive idle 1 characters as claimed. This is simply not taught or suggested by the prior art of record.

As such, it is respectfully requested that the Board reverse the Examiner with respect to the rejection of these claims.

3. Separate Patentability of Claims in Group IV:

The claims in Group IV are all directed to the use of an “Idle 2” character to

complete the synchronization process after the reception of three successive Idle 1 characters. For example, claim 6 recites “*wherein resynchronization at an end further includes detecting and transmitting an idle 2 character*” (emphasis added). Claims 7 and 13 are directed to a similar feature.

The Examiner makes no explicit rejection with regard to the claims in Group IV, but rather lumps these claims in with the rejection to the Independent claim recited in Group I. However, neither Sauer nor Olafsson teach or suggest the use of even Idle 1 characters, let alone the use of Idle 2 characters. Indeed none of the prior art of record teaches or suggests the use of Idle 2 characters, either explicitly or implicitly.

In the Examiner’s remarks, he asserts that both Idle 1 characters and Idle 2 characters are nothing more than “a combination of ones and zeros” and therefore appears to give this feature no patentable weight. However, even assuming *arguendo* that this were to be true, the prior art still fails to teach or suggest using a first sets of ones and zeros (i.e., Idle 1 characters) followed by a different set of ones and zeros (i.e., Idle 2 characters).

Thus, the Examiner has rejected the claims recited in Group IV with absolutely no prior art justification. This is clearly improper and the Board is respectfully requested to reverse the Examiner with respect to the rejection of these claims.

4. Separate Patentability of Claims in Group V:

The claim in Group V is directed to the hysteresis sub-process discussed on page 6, lines 1-7 of the application. Indeed, claim 8 recites “applying a hysteresis sub-process at one of the two ends if nonvalid data is received at that end after resynchronization has occurred at both ends” (emphasis added).

Again, this claim 8 is rejected without comment and simply lumped into the rejection of the independent claims recited in Group I over Sauer and Olafsson. However, neither of these references, alone or in combination teach or suggest “applying a hysteresis sub-process” as claimed, nor does the Examiner argue that such a teaching is set forth.

As such, the Board is respectfully requested to reverse the Examiner with respect to the rejection of this claim.

Further, Appellant points out that dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious. Artness Int'l, Inc. V. Simplistic Eng'g Co., 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987); In re Abele, 684, F.2d 902, 910, 214 USPQ 682, 689, (CCPA 1982); see also In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). Thus, based on the above discussion, the Board is respectfully requested to reverse the Examiner's rejection to the dependent claims in Groups II-V.

CONCLUSION

In sum, Appellants have invented a unique and non-obvious system for synchronizing two ends of a bi-directional communication network. Appellant submits that there is no reason, motivation, or suggestion found in the references to combine them in the manner urged by the Examiner. Moreover, the primary combination of Sauer and Olafsson is fatally flawed since neither reference, alone or in combination teaches or suggests "repeatedly transmitting from an end of the bi-directional communication path a sequence of predetermined characters if reception is lost" as claimed. Moreover, the references are also silent with regard to the features recited in the dependent claims including using three successive Idle 1 characters, using seven successive Idle 1 characters, using an Idle 2 character, and using a hysteresis sub-process. Therefore, the combination of Sauer and Olafsson, taken alone or in further combination with Jordan and Nakayama is clearly improper and one which is impermissible as a matter of law. Furthermore, it is an impossible combination as a matter of fact since the claimed invention is simply not taught or suggested.

Appellant submits that, in attempting to yield the claimed invention, the Examiner has strained the reasonable limits on what the cited references teach or suggest, in urging the prior art combination and in making his assertions as to what "would" have been done by the ordinarily skilled artisan in view of the prior art at the time of the invention. Clearly, the teachings in the prior art, taken single or, even assuming *arguendo*, in combination, fail to teach or suggest the claimed communication network as defined by Appellant's claims.

Accordingly, Appellant submits that claims 1-19, all claims presently pending in the application, are patentable and are otherwise in condition for allowance. Therefore, Appellant respectfully requests the Board to reverse the Examiner's rejections of claims 1-19.

Respectfully submitted,



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APPENDIX A

1. A method of synchronizing two ends of a bi-directional network communication path comprising:
repeatedly transmitting from an end of the bi-directional communication path a sequence of predetermined characters if reception is lost at that end; and resynchronizing the link from both ends if the sequence of predetermined characters is received at the other end.
2. The method of claim 1, wherein the predetermined character comprises an idle 1 character.
3. The method of claim 2, wherein the sequence of predetermined characters comprises seven successive idle 1 characters.
4. The method of claim 1, and further comprising:
signaling the loss of synchronization after reception is lost.
5. The method of claim 1, wherein resynchronization at an end comprises detecting and transmitting three successive idle 1 characters.
6. The method of claim 5, wherein resynchronization at an end further includes detecting and transmitting an idle 2 character.
7. The method of claim 6, and further comprising:
returning to loss of synchronization if an idle 2 character is not detected at an end within a predetermined amount of time.
- 8 (Once Amended). The method of claim 6, and further comprising:
applying a hysteresis sub-process at one of the two ends if nonvalid data is received at that end after resynchronization has occurred at both ends.
9. The method of claim 5, and further comprising:

returning to loss of synchronization if three successive idle 1 characters are not detected at an end.

10. An apparatus adapted to synchronize two ends of a bi-directional network communication path comprising:

a network interface unit adapted to repeatedly transmit from an end of the bi-directional communication path a predetermined character if reception is lost at that end;

said network interface unit being further adapted to detect a predetermined set of characters signaling to resynchronize the link from that end if reception is lost at the other end.

11. The apparatus of claim 10, wherein the predetermined character comprises an idle 1 character.

12. The apparatus of claim 10, wherein the predetermined set characters comprises three successive idle 1 characters.

13. The apparatus of claim 10, wherein said network interface unit is further adapted to detect and transmit another set of predetermined characters after detecting said set of predetermined characters.

14. The apparatus of claim 13, wherein said set of predetermined characters comprises three successive idle 1 characters and the another set of predetermined characters comprises an idle 2 character.

15. The apparatus of claim 10, wherein said network interface unit is further adapted to resynchronize the link from that end if seven successive idle 1 characters are received.

16. A system comprising:

a bi-directional communication path;

nodes coupled at each end of the bi-directional communication path;

said nodes being adapted to bi-directionally resynchronize the link so that if reception is lost at one end.

17. The system of claim 16, wherein said nodes are adapted to comply with the NGIO specification.

18. The system of claim 16, wherein each of said nodes are incompatible with nodes complying with the ethernet specification.

19. The system of claim 16, wherein each of said nodes are incompatible with nodes complying with the gigabit ethernet specification.